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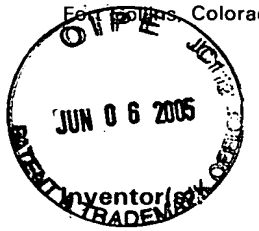
PATENT APPLICATION

ATTORNEY DOCKET NO. 10018165-1



IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Kevin J. Youngers

Confirmation No.: 5715

Application No.: 09/911,954

Examiner: Colin M. LaRose

Filing Date: July 24, 2001

Group Art Unit: 2623

Title: METHOD AND APPARATUS FOR REDUCING INACCURACIES WHEN PROCESSING COLOR DATA WITH A MATRIX

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TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on April 13, 2005.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) $500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

( ) (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

( )	one month	$120.00
( )	two months	$450.00
( )	three months	$1020.00
( )	four months	$1590.00

( ) The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account **08-2025** the sum of **$500.00**. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

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Signature: Elizabeth A. Bauer

Respectfully submitted,

Kevin J. Youngers

By _____

David N. Fogg

Attorney/Agent for Applicant(s)
Reg. No. **35,138**

Date: **06/01/2005**

Telephone No.: **(612) 332-4720**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS

Appellant:	Kevin J.Youngers	**Appeal Brief**
Serial No.	09/911,954	
Filing Date	July 24, 2001	
Group Art Unit	2623	
Examiner	Colin M. LaRose	
Attorney Docket No.	10018165-1	
Title: METHOD AND APPARATUS FOR REDUCING INACCURACIES WHEN PROCESSING COLOR DATA WITH A MATRIX		

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Introduction

On April 13, 2005, Appellants filed a notice of appeal from the final rejection of claims 1-27 set forth in the Final Office Action mailed February 16, 2005. Three copies of this Appeal Brief are hereby timely filed and are accompanied by a fee in the amount of $500.00 as required under 37 C.F.R. §1.17(c).

1. Real Party Interest

The real party in interest in the above-captioned application is the assignee Hewlett-Packard Development Company, L.P.

2. Related Appeals and Interferences

There are no other appeals or interferences known to the Appellants that will have a bearing on the Board's decision in the present appeal.

3. Status of the Claims

Claims 1-27 were finally rejected in an Office Action mailed on February 16, 2005. The rejection of claims 1-27 is being appealed.

4. Status of Amendments

No amendment has been filed subsequent to the Office action mailed February 16, 2005.

5. Summary of claimed subject matter

A. Claim 1

Claim 1 is directed to a method of processing color image data. The method of claim 1 is described at page 5, lines 8-12, and page 10, lines 4-8, and shown in Figure 2. The method includes examining the color components of a pixel in the image (202, 204) and selectively applying a matrix (206, 208) to the color components of the pixel to create an output color component only when the pixel is not in a dark area of the image.

B. Claim 4

Claim 4 is directed to a method of processing color image data contained in an array of pixels. The method of claim 4 is described at page 5, lines 8-20, and page 10, lines 17-23, and shown in Figure 2. The method includes selecting at least one threshold, reading the color components of a pixel (202), and transforming the color components of the pixel with a matrix when any of the color components of the pixel are greater than the threshold (204, 206) and otherwise preserving the pixel (204, 208).

C. Claim 6

Claim 6 is directed to a method of processing color image data contained in an array of pixels. The method of claim 6 is described at page 5, lines 8-20, page 6, line 17 to page 7, line 2, and page 11, lines 3-12 and shown in Figure 2. The method includes defining at least one threshold and defining a first and a second matrix. The method further includes reading at least 3 color components for the pixel (202), applying the first matrix to the color components of the pixel to create an output color component when any of the color components are greater than the threshold (204, 206), and otherwise applying the second matrix to the color components of the pixel to create the output color component (204, 208).

D. Claim 13

Claim 13 is directed to a scanner. The scanner of claim 13 is described at page 4, line 21 to page 5, line 20, and page 12, lines 5-12 and is shown in Figure 2. The scanner of claim 13 includes a photo-sensor array for converting an image into an electrical signal. The scanner further includes an A-to-D converter to convert the electrical signal into raw digital data and a matrix for transforming the raw digital data for color components for each of a plurality of pixels into a corrected color component for that pixel. The scanner is configured to output the corrected color component for that pixel only when the raw digital data for at least one of the color components of that pixel is greater than a pre-selected value (204, 206).

E. Claim 14

Claim 14 is directed to a method of processing color image data contained in an array of pixels. The method of claim 14 is described at page 5, lines 8-14, at page 7, line 3 to page 8 line 15, and at page 12, line 14 to page 13, line 3 and is shown in Figure 4. The method includes defining a first threshold and a second threshold, where the first threshold is larger than the second threshold and defining a first and a second matrix. The method includes reading the color components of a pixel (402), applying the first matrix to the color components of the pixel when any color component is greater than the first threshold (404, 406), applying the second matrix to the color components of the pixel when all the color components of the pixel are less than the second threshold (408, 412), and otherwise applying an interpolation between the first and second matrix to the color components of the pixel (410). This process is repeated for each pixel in the array.

F. Claim 15

Claim 15 is directed to a method of processing data contained in an array of pixels. The method of claim 15 is described at page 5, lines 8-14, at page 7, line 3 to page 8 line 15, and at page 13, lines 5 to 16 and is shown in Figure 4. The method of claim 15 includes defining a threshold, defining a range around the threshold, the range

having a top end and a bottom end, and defining a matrix. The method further includes reading the color components of a pixel (402), applying the matrix to the color components of the pixel when any of the color components are above the top end of the range (404, 406), and modifying the color components of the pixel by interpolation when all of the color components are below the top end of the range and at least one color component is above the bottom end of the range (408, 410), and; otherwise preserving the pixel (412).

G. Claim 23

Claim 23 is directed to a scanner. The scanner of claim 23 is described at page 5, lines 8 to 20, and at page 6, line 17 to page 7, line 2 and in Figure 2. The scanner includes a photo sensor array for converting an image into an electrical signal, an A-to-D converter to convert the electrical signal into raw digital data, and a first matrix and a second matrix. Both matrixes transform the raw digital data for color components for each of a plurality of pixels into a corrected color component for that pixel. The scanner configured to create the corrected color component for that pixel by selecting between the first and second matrix as a function of the raw digital data value (202, 204, 206, 208).

H. Claim 24

Claim 24 is directed to a computer readable medium containing a program for adjusting the data from the color components for pixels in a color image. The computer readable medium is described in the application at page 5, lines 8 to 20 and page 14, line 22 to page 15, line 3 and in Figure 2. The computer readable medium includes a matrix. The program is configured to modify the data from a color component for a pixel of the color image based on the data for the color components for the pixel using the matrix only when the data from at least one of the color components for the pixel is above a predetermined value (204, 206).

I. Claim 25

Claim 25 is directed to a camera. The camera is described at page 5, lines 8-20, and at page 15, lines 5-10 and in Figure 2. The camera includes a photo sensor, a lens system that forms an image on the photo sensor, a matrix for mapping image data, and a processor configured to map color components of the image data only when the image data from at least one color component exceeds a predetermined value (204, 206).

J. Claim 26

Claim 26 is directed a camera. The camera is described at page 5, lines 8-20, and at page 15, lines 12-17 and in Figure 2. The camera includes a lens system that forms an image on a photo sensor, a means for mapping image data, and a processor configured to map color components of the image data only when the image data from at least one color component exceeds a predetermined value.

Claim 26 includes a limitation that is presumptively a means plus function limitation. Specifically, claim 26 calls for "a means for mapping image data." The structure corresponding to the function of "mapping image data" is a matrix as specified, for example, in the specification at page 4, line 19 to page 8, line 15.

K. Claim 27

Claim 27 is directed to a method of processing color image data contained in an array of pixels. The method of claim 27 is described at page 5, line 8 through page 6, line 5, and at page 6, line 17 to page 7, line 2 and at page 15, line 19 to page 16, line7 and in Figure 2. The method includes defining at least three thresholds, defining a first and a second matrix, reading at least 3 color component for a pixel, applying the first matrix to the color components of the pixel to create an output color component when the first color component is larger than the first threshold or the second color component is larger than the second threshold or the third color component is larger than the third threshold (204, 206), and otherwise applying the second matrix to the color components of the

pixel to create the output color component (204, 208). The process is repeated for each pixel in the array.

6. Grounds of rejection to be reviewed on appeal

Whether claims 1-20, 22-24 and 27 are anticipated under 35 U.S.C. §102(b) by Sobol (U.S. Patent No. 5,854,859)?

Whether claim 21 is obvious under 35 USC § 103(a) over Sobol (U.S. Patent No. 5,854,859)?

Whether claims 25 and 26 are obvious under 35 USC § 103(a) over Sobol (U.S. Patent No. 5,854,859) in view of Denber (U.S. Patent No. 5,214,470)?

7. Argument

A. Rejection of Claims under 35 U.S.C. §102(b).

i. The Applicable Law

35 U.S.C. § 102 provides in relevant part:

A person shall be entitled to a patent unless-

(b) the invention was patented or described in a printed publication in this or a foreign country or in a public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

A claim is anticipated under 35 U.S.C. § 102(b) only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051,1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the...claim." *Richardson v. Suzuki Motor Co.* 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but identical terminology is not required. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990).

Anticipation focuses on whether a claim reads on a product or process disclosed in a prior art reference, not on what the reference broadly teaches. *Kalman v. Kimberly-*

Clark Corp., 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983). To anticipate a claim, a reference must disclose every element of the challenged claim and enable one skilled in the art to make the anticipating subject matter. *PPG Industries, Inc. v. Guardian Industries Corp.*, 75 F.3d 1558, 37 U.S.P.Q. 2d 1618 (Fed Cir. 1996).

ii. Rejection of claims 1-20, 22-24, and 27 under 35 U.S.C. §102(b)

Claims 1-20, 22-24 and 27 were rejected under 35 USC § 102(b) as being anticipated by Sobol (U.S. Patent No. 5,854,859). Applicant respectfully traverses the rejection.

a. Claims 1-3

Claim 1 is directed to a "method of processing color image data" that comprises "examining the color components of a pixel in the image" and "selectively applying a matrix to the color components of the pixel to create an output color component." This matrix is applied "only when the pixel is not in a dark area of the image." Sobol does not teach or suggest this claimed method.

Sobol does not teach or suggest examining the color components of a pixel and selectively applying a matrix to the color components (plural) to create an output color component (singular). Rather, Sobol is directed to a different kind of image processing. Sobol appears to apply a matrix to either a single color component or a single lightness coordinate value across a number of pixels to produce a single value with improved contrast. This differs significantly from the processing of the color components of a pixel with a matrix as called for in the claim. See, Sobol at Col. 4, lines 31-37. Therefore claim 1 is not anticipated by Sobol.

Claims 2 and 3 depend from claim 1 and are also allowable at least for the reasons identified above.

Reversal of the rejection of claims is respectfully requested.

b. Claims 4 and 5

Claim 4 is directed to a "method of processing color image data contained in an array of pixels." The method comprises "reading the color components of a pixel" and "transforming the color components of the pixel with a matrix when any of the color components of the pixel are greater than the threshold and otherwise preserving the pixel." Sobol does not teach or suggest this claimed method.

Sobol does not teach or suggest transforming the color components of a pixel when any of the color components are greater than a threshold. Further, Sobol does not teach or suggest preserving the pixel when none of the color components exceed the threshold. In Sobol, it appears that each color component is handled separately. Therefore, claim 4 is not anticipated by Sobol.

Claim 5 depends from claim 4 and is also allowable at least for the reasons identified above.

Reversal of the rejection is respectfully requested.

c. Claims 6-12

Claim 6 is directed to a method of "processing color image data contained in an array of pixels." The method comprises:

(a) defining at least one threshold;
(b) defining a first and a second matrix;
(c) reading at least 3 color components for the pixel;
(d) applying the first matrix to the color components of the pixel to create an output color component when any of the color components are greater than the threshold, and;
(e) otherwise applying the second matrix to the color components of the pixel to create the output color component.

Sobol does not teach or suggest reading at least 3 color components for the pixel, applying a first matrix to the color components of the pixel when any of the color components exceeds a threshold and otherwise applying a second matrix to create the color component. Sobol does not apply one of two matrices to create an output color

component from the 3 read color components as called for in the claim. Therefore, claim 6 is not anticipated by Sobol.

Claims 7-12 depend directly or indirectly from claim 6 and are also allowable at least for the reasons identified above.

Reversal of the rejection is respectfully requested.

d. Claim 13

Claim 13 is directed to a scanner. The scanner comprises:

> a matrix for transforming the raw digital data for color components for each of a plurality of pixels into a corrected color component for that pixel;
>
> the scanner configured to output the corrected color component for that pixel only when the raw digital data for at least one of the color components of that pixel is greater than a pre-selected value.

Sobol does not teach or suggest a scanner with a matrix that transforms raw digital data for color components for each of a plurality of pixels into a corrected color component for that pixel. Further, Sobol does not teach or suggest a scanner that outputs the corrected color component for that pixel only when the raw digital data for at least one of the color components of that pixel is greater than a selected threshold. Therefore, claim 13 is not anticipated by Sobol.

Reversal of the rejection is respectfully requested.

e. Claim 14

Claim 14 is directed to a method of processing color image data contained in an array of pixels. The method comprises:

> defining a first threshold and a second threshold, where the first threshold is larger than the second threshold;
>
> defining a first and a second matrix;
>
> (a) reading the color components of a pixel;
>
> (b) applying the first matrix to the color components of the pixel when any color component is greater than the first threshold;

(c) applying the second matrix to the color components of the pixel when all the color components of the pixel are less than the second threshold, and;

(d) otherwise applying an interpolation between the first and second matrix to the color components of the pixel; repeating steps (a) through (d) for each pixel in the array.

Sobol does not teach or suggest the method of claim 14. Sobol does not teach or suggest reading color components for a pixel and selectively applying one of first and second matrices to the color components based on comparisons with first and second thresholds. Further, Sobol does not teach or suggest applying an interpolation between the first and second matrix to the color components of the pixel when all of the color components are between the thresholds. The Examiner attempts to characterize the use of a set of matrices as meeting the interpolation limitation of this claim. There is nothing in Sobol that teaches or suggests that the matrices used in Sobol implement an interpolation function between two matrices. Therefore, claim 14 is not anticipated by Sobol.

Reversal of the rejection is respectfully requested.

f. Claims 15-20, and 22

Claim 15 is directed to a "method of processing data contained in an array of pixels." The method comprises:

defining a threshold;

defining a range around the threshold, the range having a top end and a bottom end;

defining a matrix;

(a) reading the color components of a pixel;

(b) applying the matrix to the color components of the pixel when any of the color components are above the top of the high end;

(c) modifying the color components of the pixel by interpolation when all of the color components are below the top end of the high range and at least one color component is above the bottom end of the low range, and; otherwise preserving the pixel.

Sobol does not teach or suggest "reading the color components of a pixel," "applying the matrix to the color components when any of the color components are above the top of the high end," and "modifying the color components of the pixel by interpolation when all of the color components are below the top end of the high range and at least one color component is above the bottom end of the low range." Therefore, claim 15 is not anticipated by Sobol.

Claims 16 – 20 and 22 depend directly or indirectly from claim 15 and are also allowable at least for the reasons identified above.

Reversal of the rejection is respectfully requested.

g. Claim 23

Claim 23 is directed to a "scanner." The scanner comprises:

> a photo sensor array for converting an image into an electrical signal;
>
> an A-to-D converter to convert the electrical signal into raw digital data;
>
> a first matrix and a second matrix, both matrixes for transforming the raw digital data for color components for each of a plurality of pixels into corrected color component for that pixel;
>
> the scanner configured to create the corrected color component for that pixel by selecting between the first and second matrix as a function of the raw digital data value.

Sobol does not teach or suggest a scanner with a first and second matrix that transform raw digital data for color components for each of a plurality of pixels into a corrected color component for that pixel. Further, Sobol does not teach or suggest a scanner that creates the corrected color component for that pixel by selecting between the first and second matrix as a function of the raw digital data value. Therefore, claim 23 is not anticipated by Sobol.

Reversal of the rejection is respectfully requested.

h. Claim 24

Claim 24 is directed to a computer readable medium containing a program for adjusting the data from the color components for pixels in a color image. The program is

> configured to modify the data from a color component for a pixel of the color image based on the data for the color components for the pixel using the matrix only when the data from at least one of the color components for the pixel is above a predetermined value.

Sobol does not teach or suggest a program that is configured to modify a color component of a pixel using a matrix based on the color components for a pixel when one of the color components is above a predetermined value. Therefore, claim 24 is not anticipated by Sobol.

Reversal of the rejection is respectfully requested.

i. Claim 27

Claim 27 is directed to a method of processing color image data contained in an array of pixels. The method reads "at least 3 color components for a pixel." The method applies a first matrix "to the color components of the pixel to create an output color component when the first color component is larger than the first threshold or the second color component is larger than the second threshold or the third color component is larger than the third threshold" and otherwise applies a second matrix "to the color components of the pixel to create the output color component."

Sobol does not teach or suggest applying first and second matrices under the claimed conditions to at least three color components for a pixel to produce a color component. Therefore, claim 27 also is not anticipated by Sobol.

Reversal of the rejection is respectfully requested.

C. Rejection of Claims Under 35 U.S.C. § 103(a)

i. The Applicable Law

35 U.S.C. § 103 provides in relevant part:

Conditions for patentability, non-obvious subject matter.

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

"The ultimate determination...whether an invention is or not obvious is a legal conclusion based on underlying factual inquiries including (1) the scope and content of the prior art; (2) the level of ordinary skill in the prior art; (3) the differences between the claimed invention and the prior art; and (4) the objective evidence of nonobviousness." In re Dembiczak, 175 F.3d 994, 998, 50 USPQ2d 1614, 1616 (1999) (citing Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966)).

When applying 35 U.S.C. §103, the claimed invention must be considered as a whole; the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention and a reasonable expectation of success is the standard with which obviousness is determined. Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestions or motivation, either in the references themselves or in the knowledge generally available to one of the ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP 2143.

The teaching or suggestions to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant's disclosure. MPEP 2143 citing In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

ii. Rejection of claim 21 under 35 U.S.C. §103(a)

Claim 21 was rejected under 35 USC § 103(a) as being unpatentable over Sobol (U.S. Patent No. 5,854,859). Applicant respectfully traverses the rejection.

Claim 21 depends from claim 15 and is also patentable at least for the reasons identified above with respect to claim 15. Reversal of the rejection is respectfully requested.

iii. Rejection of claims 25 and 26 under 35 U.S.C. §103(a)

Claims 25 and 26 were rejected under 35 USC § 103(a) as being unpatentable over Sobol (U.S. Patent No. 5,854,859) in view of Denber (U.S. Patent No. 5,214,470). Applicant respectfully traverses this rejection.

a. Claim 25

Claim 25 is directed to a "camera." Claim 25 calls for:

> a photo sensor;
> a lens system that forms an image on the photo sensor;
> a matrix for mapping image data;
> a processor configured to map color components of the image data only when the image data from at least one color component exceeds a predetermined value.

Neither of the references, alone or in combination, teach or suggest a camera that comprises a matrix for mapping image data and a processor that maps color components of the image data only when the image data from at least one color component exceeds a predetermined threshold. Therefore claim 25 is not obvious.

Reversal of the rejection is respectfully requested.

b. Claim 26

Claim 26 is directed to a camera and calls for:

> a lens system that forms an image on a photo sensor;
> a means for mapping the image data;

a processor configured to map color components of the image data only when the image data from at least one color component exceeds a predetermined value.

Neither of the references, alone or in combination, teach or suggest a camera that comprises a "means for mapping the image data" and a processor that maps color components of the image data only when the image data from at least one color component exceeds a predetermined threshold. Therefore claim 26 is not obvious.

Reversal of the rejection is respectfully requested.

Respectfully submitted,

Date: June 1, 2005

David N. Fogg
Reg. No. 35,138

Attorneys for Applicant
Fogg and Associates, LLC
P.O. Box 581339
Minneapolis, MN 55458-1339
T 612-332-4720
F 612-332-4731

CLAIMS APPENDIX

1. A method of processing color image data, comprising:

(a) examining the color components of a pixel in the image;

(b) selectively applying a matrix to the color components of the pixel to create an output color component only when the pixel is not in a dark area of the image.

2. The method of claim 1, further comprising:

repeating steps (a) and (b) for essentially each pixel in the image.

3. The method of claim 1, further comprising:

blending the transition between pixels in the image that are in a dark area and pixels in the image that are not in a dark area.

4. A method of processing color image data contained in an array of pixels, comprising: selecting at least one threshold;

(a) reading the color components of a pixel;

(b) transforming the color components of the pixel with a matrix when any of the color components of the pixel are greater than the threshold and otherwise preserving the pixel.

5. The method of claim 4, further comprising:

repeating steps (a) and (b) for essentially each pixel in the array.

6. A method of processing color image data contained in an array of pixels, comprising:

(a) defining at least one threshold;

(b) defining a first and a second matrix;

(c) reading at least 3 color components for the pixel;

(d) applying the first matrix to the color components of the pixel to create an output color component when any of the color components are greater than the threshold, and;

(e) otherwise applying the second matrix to the color components of the pixel to create the output color component.

7. The method of claim 6 further comprising:

(f) repeating steps (c) through (e) for each pixel in the image.

8. The method of claim 7 where steps (a) through (f) are repeated to create a new output color component for each of the color components in the color image.

9. The method of claim 8 where a different threshold is used to create each output color component in the color image.

10. The method of claim 8 where there are different matrices for creating each output color component in the color image.

11. The method of claim 6 where the threshold is approximately 10 eight bit counts.

12. The method of claim 6 where the threshold is approximately 6 eight bit counts.

13. A scanner, comprising:

a photo-sensor array for converting an image into an electrical signal;

an A-to-D converter to convert the electrical signal into raw digital data;

a matrix for transforming the raw digital data for color components for each of a plurality of pixels into a corrected color component for that pixel;

the scanner configured to output the corrected color component for that pixel only when the raw digital data for at least one of the color components of that pixel is greater

than a pre-selected value.

14. A method of processing color image data contained in an array of pixels, comprising:

defining a first threshold and a second threshold, where the first threshold is larger than the second threshold;

defining a first and a second matrix;

(a) reading the color components of a pixel;

(b) applying the first matrix to the color components of the pixel when any color component is greater than the first threshold;

(c) applying the second matrix to the color components of the pixel when all the color components of the pixel are less than the second threshold, and;

(d) otherwise applying an interpolation between the first and second matrix to the color components of the pixel; repeating steps (a) through (d) for each pixel in the array.

15. A method of processing data contained in an array of pixels, comprising:

defining a threshold;

defining a range around the threshold, the range having a top end and a bottom end;

defining a matrix;

(a) reading the color components of a pixel;

(b) applying the matrix to the color components of the pixel when any of the color components are above the top end of the range;

(c) modifying the color components of the pixel by interpolation when all of the color components are below the top end of the range and at least one color component is above the bottom end of the range, and; otherwise preserving the pixel.

16. The method of claim 15 further comprising:

repeating steps (a) through (c) for each pixel value in the array.

17. The method of claim 16 where steps (a) through (c) are repeated to create a new output color component for each of the color component in the color image.

18. The method of claim 17 where a different threshold is used to create each output color component in the color image.

19. The method of claim 17 where there are different matrices for creating each output color component in the color image.

20. The method of claim 15 where the threshold is approximately 10 eight bit counts.

21. The method of claim 15 where the range is approximately 2 eight bit counts.

22. The method of claim 15 where the threshold is approximately 6 eight bit counts.

23. A scanner, comprising:

a photo sensor array for converting an image into an electrical signal;

an A-to-D converter to convert the electrical signal into raw digital data;

a first matrix and a second matrix, both matrixes for transforming the raw digital data for color components for each of a plurality of pixels into a corrected color component for that pixel;

the scanner configured to create the corrected color component for that pixel by selecting between the first and second matrix as a function of the raw digital data value.

24. A computer readable medium containing a program for adjusting the data from the color components for pixels in a color image, comprising:

a matrix;

the program configured to modify the data from a color component for a pixel of the color image based on the data for the color components for the pixel using the matrix only when the data from at least one of the color components for the pixel is above a predetermined value.

25. A camera, comprising:

a photo sensor;

a lens system that forms an image on the photo sensor;

a matrix for mapping image data; and

a processor configured to map color components of the image data only when the image data from at least one color component exceeds a predetermined value.

26. A camera, comprising:

a lens system that forms an image on a photo sensor;

a means for mapping image data; and

a processor configured to map color components of the image data only when the image data from at least one color component exceeds a predetermined value.

27. A method of processing color image data contained in an array of pixels, comprising:

(a) defining at least three thresholds;

(b) defining a first and a second matrix;

(c) reading at least 3 color component for a pixel;

(d) applying the first matrix to the color components of the pixel to create an output color component when the first color component is larger than the first threshold or the second color component is larger than the second threshold or the third color component is larger than the third threshold, and;

(e) otherwise applying the second matrix to the color components of the pixel to create the output color component;

(f) repeating steps (c) through (e) for each pixel in the array.